

Installation Instructions

ELECTRONIC AIR CLEANER

bryant

INTRODUCTION

The Bryant Model 907 Series A Electronic Air Cleaner is available in three sizes: 12-907 (1200 CFM), 16-907 (1600 CFM), and 24-907 (2400 CFM). They are designed for use with residential and light commercial forced-air heating and/or cooling systems and can be installed in a vertical or horizontal section of a typical return air duct system.

The electronic components of the unit convert the 120 VAC of the power supply to 7200 VDC which imparts an electrical charge to airborne particles such as smoke, bacteria, pollen, and dust. These charged particles are then attracted by the dust-collecting media, thus purifying the airstream.

The electronic air cleaner consists of:

1. A cabinet containing the air cleaning assembly.
2. A power door assembly.

See Figure 2.

CABINET. A casing encloses three sections that make up the air cleaning assembly. These sections are:

1. Mechanical prefilter. An expanded metal first-stage filter that removes lint and larger dust particles.
2. Ionizer section. Consists of tungsten wires (that receive a positive charge) mounted between grounded steel channels and supported by polyester, glass-reinforced insulators.
3. Collector section. Consists of two grounded wire grills and one center plate (that receives a positive charge) with two fiber glass dirt collecting "media" pads, one on either side of the center plate. See Figure 11.

POWER DOOR ASSEMBLY. See Figure 10. The door assembly consists of:

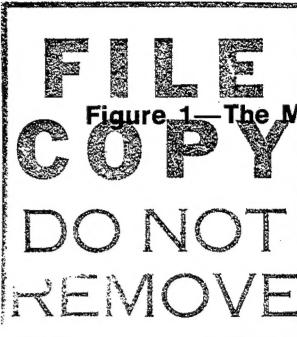
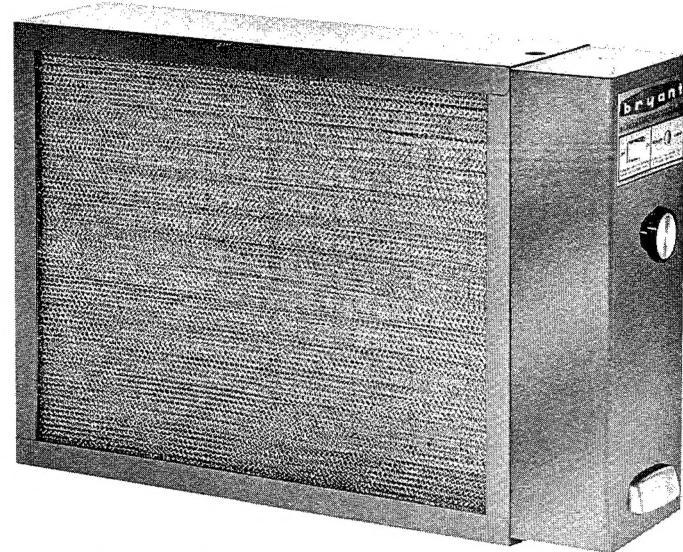
1. A power indicator light, ON-OFF switch, and lock knob installed on the door cover.
2. A door base plate contains an encapsulated power pack, a surge resistor, and wiring that are mounted internally. A line voltage disconnect (male plug) and high-voltage spring bus-bar is mounted on the base plate externally. Six screws must be removed to expose the power pack and wiring.

Power Pack. The supply circuit to the power pack, which is wired across the system air blower, is controlled by an ON-OFF power switch. With the power switch ON (assuming power door locked and air

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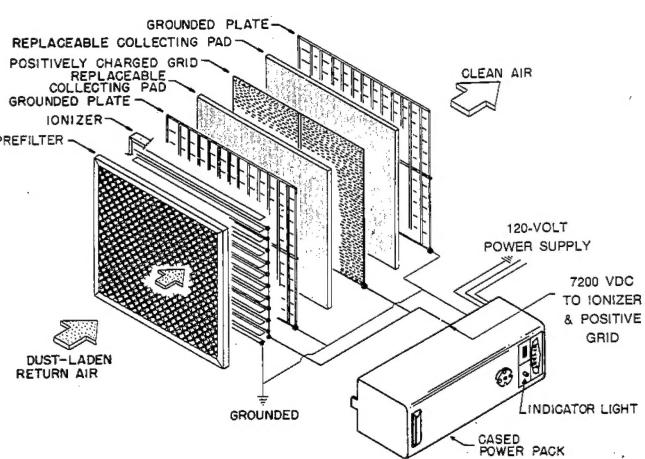
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Figure 1—The Model 907 Electronic Air Cleaner



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Figure 2—Air Cleaner Components

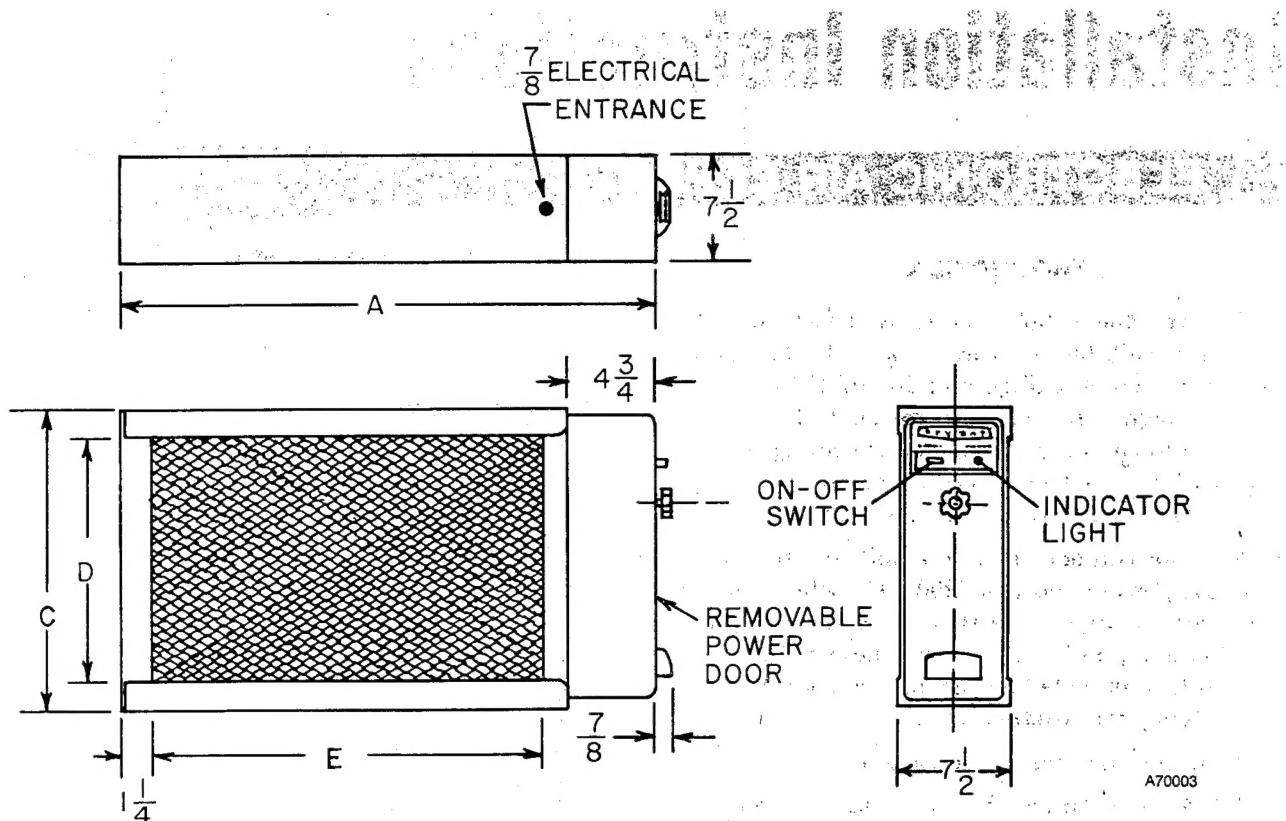


Figure 3—Dimensional Drawing

TABLE I—DIMENSIONS

Model	A	C	D	E
12-907	31-1/4	20-3/16	17-11/16	24
16-907	31-1/4	25-11/16	23-3/16	24
24-907	33-1/4	31-3/16	28-11/16	26

TABLE II—PHYSICAL DATA

Model	12-907	16-907	24-907
Air Volume Range	CFM	600-1200	800-1600
Filter Area	sq ft	3.37	4.36
Face area	in.	18 x 25	24 x 26
Nominal size	in.	18 x 25	24 x 26
Electrical Data		120 volts AC,	
Input (to power door)		single phase, 60 Hertz	
Output to unit		7200 volts DC, 1.7 Milliamps	
Approx Shipping Weight	lbs	48	54
			61

TABLE III—PRESSURE DROP AT VARIOUS AIRFLOWS.

12-907		16-907		24-907	
CFM	Pressure Drop Inches wc	CFM	Pressure Drop Inches wc	CFM	Pressure Drop Inches wc
600	0.05	800	0.05	1400	0.09
700	0.07	1000	0.08	1600	0.12
800	0.085	1200	0.11	1800	0.15
900	0.107	1400	0.15	2000	0.18
1000	0.13	1600	0.19	2200	0.22
1100	0.16			2400	0.26
1200	0.19				

Note: Using the electronic air cleaner on air duct systems designed for airflows lower than 600 CFM for Model 12-907, 800 CFM for 16-907, and 1400 CFM for 24-907 is not recommended.

blower operating), 120-VAC $\pm 10\%$ single phase, 60-Hz current is applied to the power pack transformer. The output of the transformer secondary is approximately 3600 VAC and alternately charges two capacitors through two silicon rectifiers. The total charge across both capacitors results in a power pack output of approximately 7200 VDC; therefore, the circuit is classed as a voltage doubler circuit.

NOTE: Power packs are completely encapsulated and not field repairable. The surge resistor is external to the power pack and can be readily replaced in the field.

IMPORTANT—Read Before Installing

1. Check local codes and ordinances for additional requirements pertaining to installation of unit.
2. Check electrical power supply to building to be sure rated voltage, frequency, and phase correspond to that on unit rating plate.

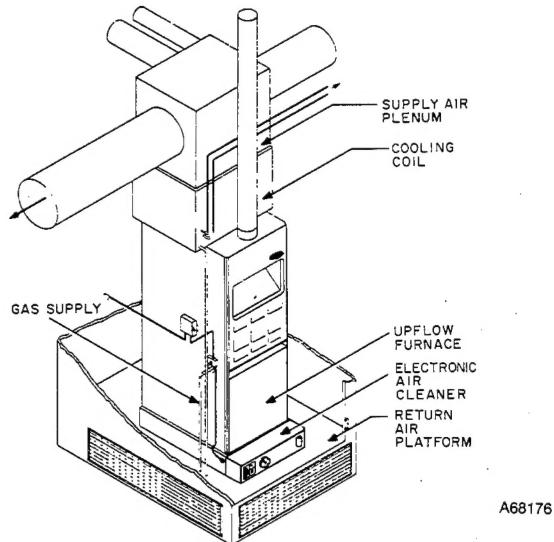


Figure 4—Typical Upflow Furnace Installation

Installation of the Model 907 consists of the following steps (sections):

- I. Locating the Unit
- II. Connecting the Air Ducts
- III. Making Electrical Connections
- IV. Start-up and Adjustment

In addition, the following sections are also included:

- V Maintenance
- VI. Recommended Service Procedures

IMPORTANT—Read Before Installing

3. Because Model 907 cleans only air brought to it by system blower, run blower continuously, or as much as possible—summer and winter.
4. Do not block air outlets and returns with draperies or furniture.

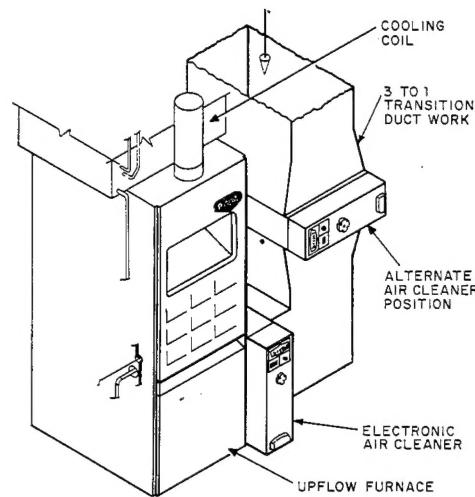


Figure 5—Typical Basement Furnace Installation

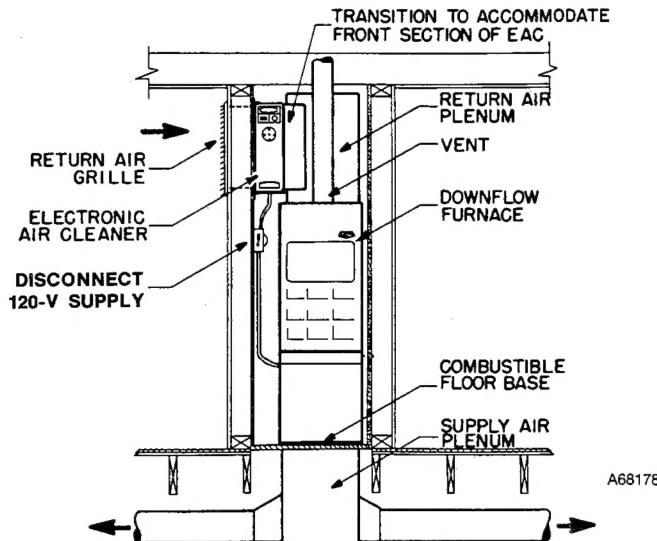


Figure 6—Typical Downflow Furnace Installation

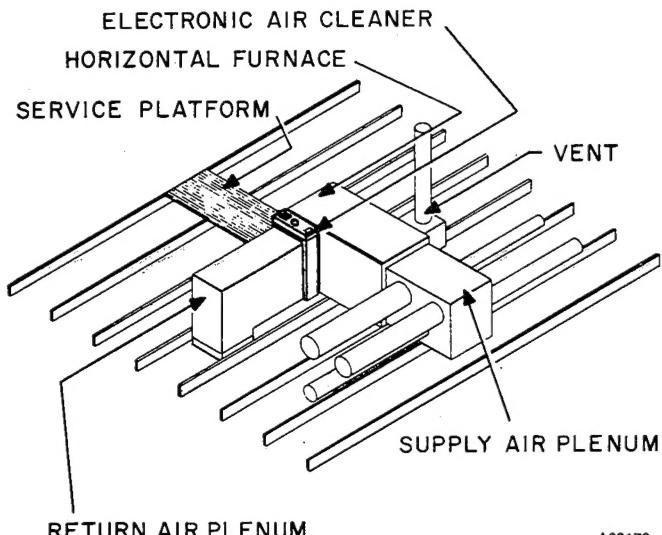


Figure 7—Typical Horizontal Furnace Installation

I. LOCATING THE UNIT

Figures 4, 5, 6, and 7 show the air cleaner in the return air duct of some typical furnace installations with and without air conditioning. Other methods of installing the unit are permissible if the design procedure outlined in the Product Data Sheet is observed.

When planning an installation, consider the following:

1. The air cleaner is approved only for indoor installation. If an outdoor installation is used, the unit must be housed in a weatherproof enclosure.
2. The air cleaner may be placed on its right or left side in a vertical or horizontal position. It must be installed on the inlet air side of the heating and/or cooling unit. Be sure that the airflow through the air cleaner is in the same direction as the airflow arrow indicates.

CAUTION: Cabinets will support a maximum weight of 400 lbs when installed beneath a vertical furnace or air-handling unit. When setting furnace on cabinet, do not drop it into place. Position furnace correctly on cabinet to prevent a corner from slipping down and damaging cabinet.

3. Allow a minimum of 30 inches clearance in front of the unit for cleaning and maintenance.
4. The air cleaner should never be used to collect grease or other flammable contaminants.
5. If a humidifier is used, moisture should be introduced downstream from the air cleaner.

II. CONNECTING THE AIR DUCTS

Dispose of existing mechanical furnace filters. They are not required. Move ON-OFF switch to OFF and unlock the power door by rotating the knob (approximately 10 turns counter-clockwise) until the door is free. Grasp the power door by the knob and the door handle and remove it from the cleaner casing by pulling it towards you. This motion disengages the 120-V power supply connector.

Remove and discard the cardboard packing taped to the inside surface of the door. See Figure 8. Slide out all three sections. See Figure 9. Note there are no

standing flanges on the air cleaner casing. This permits a greater range of application. If flanges are needed, "L"-shaped standing seam duct cleats can be used for connecting the ductwork, or to position the furnace on top of the air cleaner. All downstream connections must be properly sealed to prevent infiltration of unfiltered air.

CAUTION: If flanged sheet metal ducts are metal-screwed to the unit casing, do not use screws longer than 1/2 inch.

Airflow across the air cleaner must be uniform for best results. Turning vanes should be installed if the air cleaner is installed close to an elbow. Depending

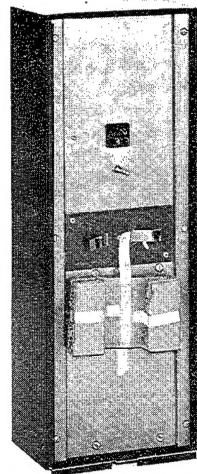
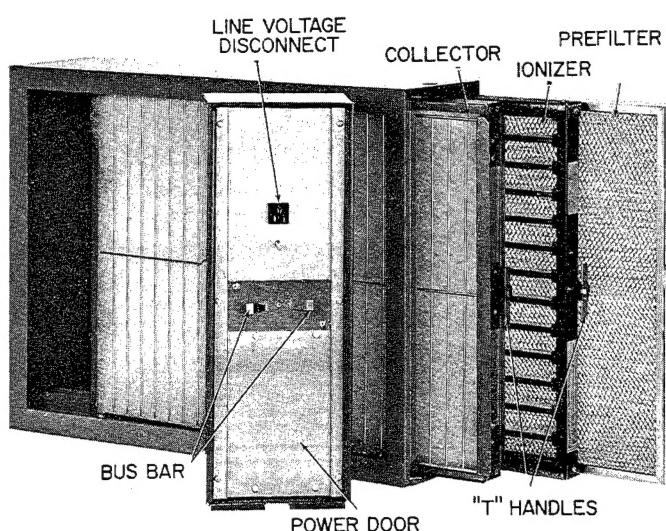


Figure 8
Power Door Packing

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Figure 9—Power Door Removed from Air Cleaner

on the size of the furnace, it may or may not be necessary to reduce the ductwork on the leaving air side of the air cleaner. Whatever the application, a 3 to 1 duct reduction ratio should be maintained (3 inches of duct length for every 1 inch reduction in size).

NOTE: Do not baffle off any portion of the entering air side of the cleaner.

When changes in duct size would be too abrupt, an alternate horizontal position may be used, as illustrated in Figure 5.

For best results, use multiple return air grills located at or near floor level. Higher cleaning efficiencies and lower blower operating costs are obtained by limiting the filter face velocity to 350 ft/min.

III. MAKING ELECTRICAL CONNECTIONS

1. With power door removed, remove junction box cover located above female plug on casing center channel.
2. Air cleaner casing has a top line-voltage entrance hole. Use hole (install strain relief) to run two-wire with ground electric cable into position for making connections at female plug.
3. Connect power leads to black and white pigtails extending from female plug, using wire nuts provided.
4. Connect ground to green pigtail extending from female plug box, using wire nut provided. Replace junction box cover.
5. Slide prefilter, ionizer, and collector sections into casing.
6. Replace power door by first inserting bottom tab into place on bottom edge of door opening. Push top of door and guide lock knob screw (Figure 10) into threads. Turn knob clockwise until screw engages threads in casing. Continue turning knob clockwise until door is securely locked.
7. Use proper wiring diagram for single-or multiple-speed blowers. If cleaner is wired to a multi-speed direct drive motor, it must be isolated by a relay.

IV. START-UP AND ADJUSTMENT

1. Move switch on power door to ON.
2. Set thermostat to start blower.

3. Check to see if amber indicator light is glowing. This indicates proper unit operation.

4. Adjust airflow to no more than 350 ft/min. This can be done with velometer or as described in filter flag instruction (optional).

V. MAINTENANCE

Because normal maintenance (cleaning) is so simple, most homeowners will choose to personally perform the necessary operations.

Clean the unit where dust from the media pads will not soil carpets or the floor.

To gain access to the prefilter, ionizer and collector filter stages, simply push power switch to OFF position and remove the power door as outlined previously. Lay it off to one side. Pull out the first-stage prefilter and vacuum from entering air side, or wash in detergent and water. Let dry thoroughly. Re-install. Do not spray prefilter with any filter coatings.

Collector pads should be replaced every 3 months or whenever indicated by the optional filter flag or monitor panel. This time interval, of course, will vary with service conditions.

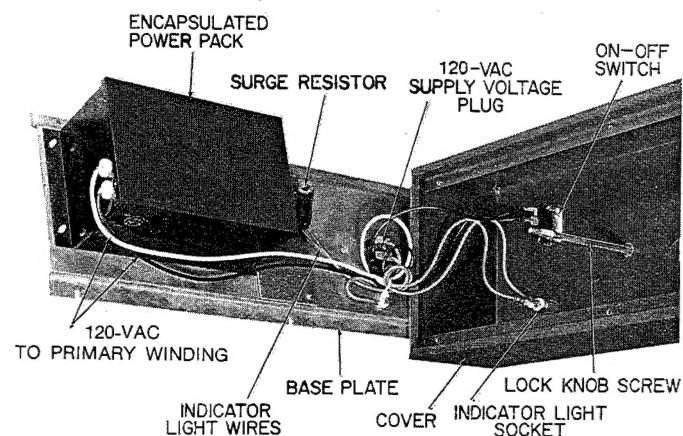


Figure 10—Power Door Internal Detail

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To replace the media pads:

1. Slide collector section (Figure 11) from unit and place it, yellow-side down, on a piece of paper (should be more than twice as large as collector) laid out on a flat surface.
2. Deflect spring clips downward, lift wire grill and pivot it upward enough to remove dirty media pad. Place soiled pad to one side.
3. Place clean pad on perforated center plate of collector frame. Pad should completely cover center plate and insulators.
4. Pivot wire grill downward and deflect spring clips until grill is engaged.
5. Turn collector section over and repeat steps 2, 3, and 4 to change other media pad.

NOTE: For best results, do not clean and reuse dirty media pads. They can, however, be reused temporarily by vacuuming or shaking out accumulated dust. Pads can be vacuumed through the wire grill. Use brush attachment of cleaner.

6. Slide collector section on its track completely into casing.
7. Roll up dirty pads and paper and dispose of them.

The ionizer assembly should be cleaned at the start of each heating and cooling season by using the long brush attachment of a vacuum cleaner; manually by using a soft, long bristled brush; by wiping the plates with a damp cloth; or by a combination of these three methods. Care must be taken not to break the ionizer wires or bend the ionizer plates.

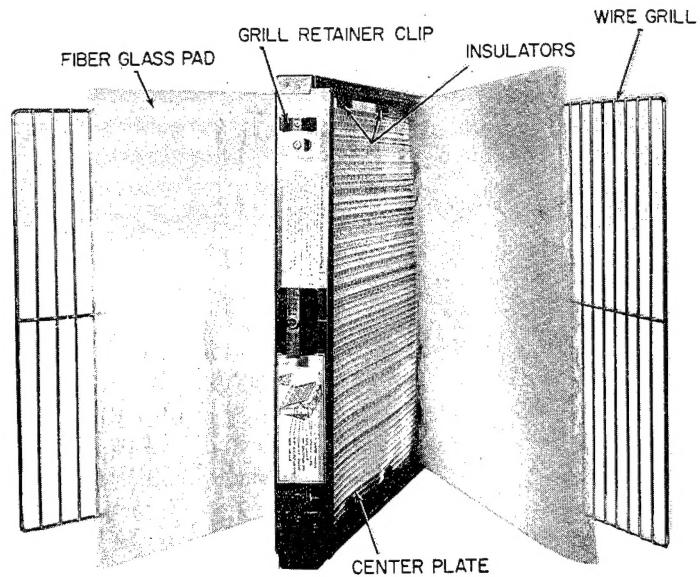
CAUTION: The collector center plate, frame, and grounded grills may need occasional cleaning. The grounded grills need only be wiped off to clean. The metal frame and center plate assembly may be wiped with a damp cloth, but should not be soaked in water, as damage may result.

After cleaning and reassembly of components, reinstall the power door. Make sure that door is securely locked. Move power switch to ON. Unit is now ready for operation.

VI. RECOMMENDED SERVICE PROCEDURES

Tools required for servicing:

Jumper cord, 1-wire



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Figure 11—Collector Section Components

Jumper cord, 3-wire
Voltmeter (capable of measuring up to 10,000 VDC)
Screwdriver, slotted head
Pliers, long nose

1. MALFUNCTIONS THAT PREVENT INDICATOR LIGHT OPERATION

A glowing indicator light indicates that the power pack is energized and that the proper DC voltage is being supplied to the air cleaner. If the light is off, make the following checks:

A. **CHECK PRIMARY VOLTAGE.** If the primary voltage does not read between 108 and 132 VAC at the outlet receptacle (female plug) on the casing centerpost, check the 120-VAC power source.

If the voltage reading at the centerpost receptacle is within the $120\text{-VAC} \pm 10\%$ range, check further to isolate the problem to:

1. Power door
2. Indicator light

WARNING: Always ground the power pack when bench testing. Ground the base plate if the power pack is removed from the unit. Do not touch the power pack, collector section, or ionizer section when energized.

B. CHECK CABINET ASSEMBLY

1. Make sure all components are correctly assembled as shown in Figure 2.
2. Turn ON-OFF switch to OFF.
3. Remove power door.
4. Install 3-wire jumper cord from male (line voltage disconnect) plug on power door to female plug on casing centerpost. See Figure 12.

WARNING: Bus-bars on the inside face (base plate) of the power door are charged to approximately 7500-9000 VDC when ON-OFF switch is ON.

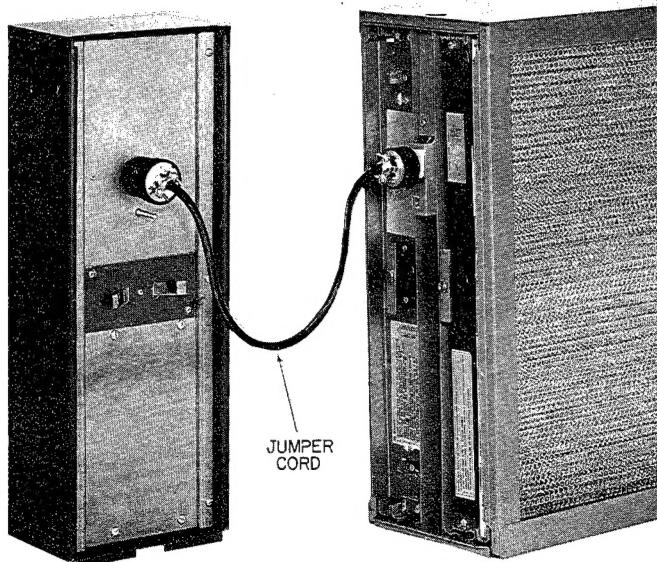
5. Move ON-OFF switch to ON.
 - a. If indicator light does not glow, proceed to check high-voltage output, indicator light, and encapsulated power pack.
 - b. If indicator light glows, check out ionizer and collector sections for possible short. Move switch OFF; clip jumper between bus-bar (on base plate) and "T" handle on section testing. Push switch ON. If indicator light glows when section is energized separately, section is good. If light does not glow, section is shorting out. If either section is defective, refer to Step 6a and 6b that follow for corrective action procedures. If both collector and ionizer pass their checkouts, look for trouble in the power door. Be sure to push switch OFF and remove jumper cord before proceeding to check filter sections and power door.

6a. Check out ionizer section for:

(1) Excessive dirt on ionizer wires or ionizer channels. Clean with vacuum cleaner brush. If necessary, use cloth dampened in detergent and water solution. (Dry thoroughly before reassembly).

(2) Bowed or dented ionizer channels. Make sure channels are approximately parallel. Wires should be spaced at least 3/8 inch from channels. Straighten channels if necessary.

(3) Broken or loose ionizer wires. Replace wires using long-nosed pliers, as shown in Figure 14. Place terminal on one end of wire in notch in ionizer bus-bar. Grasp terminal on other end of wire with pliers and pull wire firmly. Depress ionizer bus-bar with screwdriver until you can fit wire into notch on bus-bar; position terminal on bus-bar, then remove screwdriver pressure on bus-bar.



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Figure 12—Checking Indicator Light

(4) Broken, cracked, or loose insulator or insulators. Replace complete ionizer section.

(5) Broken spotwelds between ionizer channels and center ground strap. Refasten strap to channel with pop rivet or sheet metal screw.

6b. Check out collector section for:

(1) Dirty media pads. Clean or replace. Reassemble collector section. Indicator light should now glow if dirty pads were problem source.

(2) Bent grills or perforated center plate. Straighten.

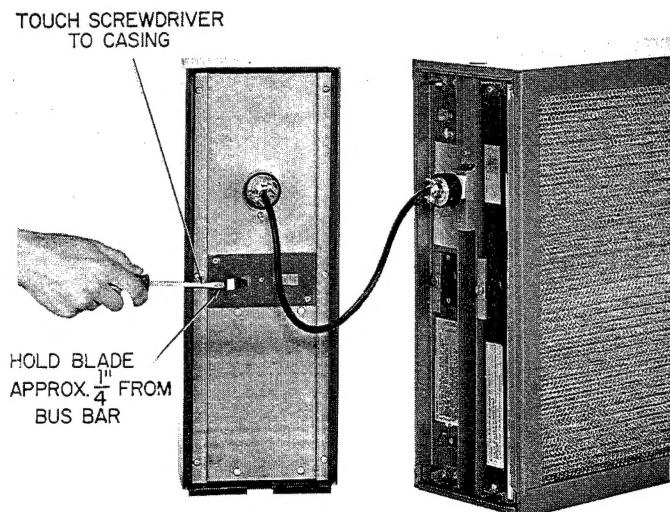
(3) Broken, cracked, or loose insulator or insulators. Replace collector section.

C. CHECK HIGH-VOLTAGE OUTPUT. If the ON-OFF light still will not glow and it has been determined that the trouble is not in the cabinet assembly, proceed to check the high-voltage output as follows:

1. Remove base plate from power door.
2. Disconnect surge resistor from terminal on base plate. See Figure 10.
3. Install 3-wire jumper cord from male (line voltage disconnect) plug on casing centerpost. See Figure 12.
4. Push ON-OFF switch ON. If light glows, trouble is isolated to high-voltage terminal, surge resistor, broken or damaged bus-bar insulators.

D. CHECK INDICATOR LIGHT. If the indicator light still does not glow when the high-voltage wire is disconnected from the bus-bar on the base plate, check the voltage supplied to the light as follows:

1. Disconnect light leads at light.



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Figure 13—Checking High-Voltage DC Supply

2. Energize encapsulated power pack and measure voltage across light leads. Reading must be 90 to 130 VDC.

3. If voltage is within tolerance, indicator light is defective. Replace.

E. CHECK ENCAPSULATED POWER PACK. See Figure 10. If the voltage supplied by the power pack to the indicator light is less than 60-90 VDC when the high-voltage wire is disconnected from the bus-bar and the power pack is energized:

1. Power pack has defective circuit.
2. Check terminal on surge resistor for high-voltage output of power pack. Voltage must read 7500-9000 VDC with surge resistor disconnected from bus-bar. With air cleaner components energized, operating voltage is approximately 7200 VDC. If meter is not available for a voltage measurement, ground blade of an insulated handle screwdriver against grounded base plate and move blade tip towards surge resistor terminal. See Figure 13. A spark should occur at a gap of 1/8 to 3/16 inch between terminal and screwdriver tip, indicating potential of approximately 8000 VDC.

3. Encapsulated power pack is defective. Replace.

F. CHECK SURGE RESISTOR. De-energize the power pack and check the surge resistor in place on the power pack. See Figure 10. The measurement should be 15,000 ohms, 30 watts. Replace if shorted or open.

A shorted resistor does not properly protect the power pack. An open resistor means that the high-voltage cord and air cleaner components are not receiving high-voltage power.

G. CHECK FOR HIGH-HUMIDITY SHORTING. During periods of high (over 80 percent) relative humidity, there exists a possibility that the two normally nonconductive media pads can absorb enough moisture to support conduction between the high positive potential center plate of the collector section and the two grounded grills. The result is excessive current draw and the collapse of transformer voltage. The indicator light goes out. Continuing operation of the blower in the system should dry out the pads to stop center plate-to-grill conduction. The high voltage will be restored and the indicator light will glow again.

Humidifiers, when used, should be installed downstream from the air cleaner to avoid the possibility of high-humidity shorting.

2. HUMMING NOISE

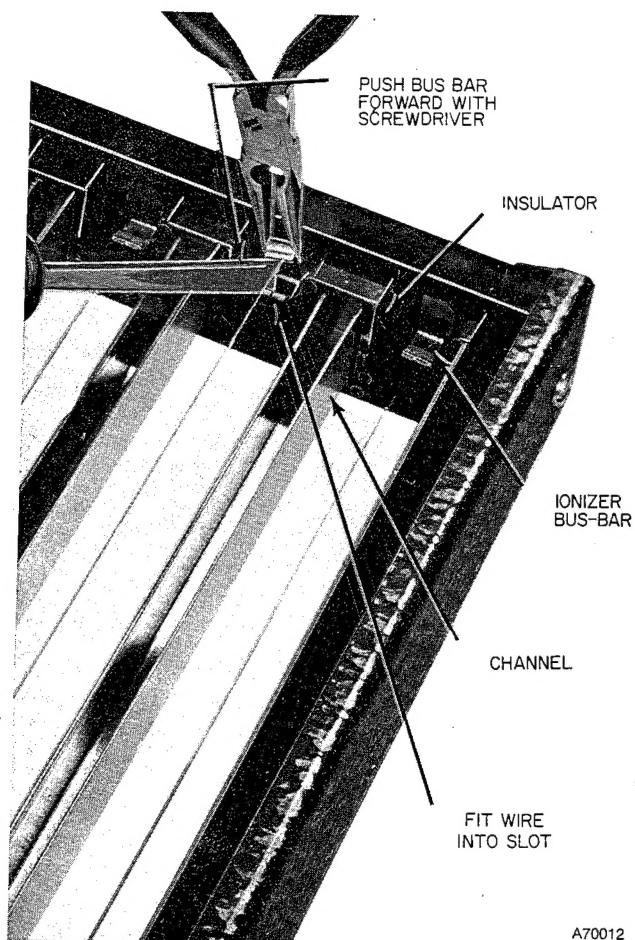
Check for the following:

- A. Improper wiring connections.
- B. Loose ionizer wires. Repair or replace.
- C. Excessively dirty ionizer or collector section (including media pads). Clean.

3. CONSTANT OR INTERMITTENT ARCING

Check for:

- A. Loose or defective ionizer wire or wires. Repair or replace.
- B. Excessively dirty ionizer or collector section (including media pads). Clean.
- C. Foreign matter such as string lodged in or close to ionizer section and flapping in airstream. Remove.
- D. Bent ionizer channels. Straighten if possible; if unable to straighten, replace ionizer section.
- E. Broken insulators in either ionizer or collector section. Replace ionizer or collector section.
- F. Dents in one or both collector section wire grills. Straighten if possible; if not, replace grill.
- G. Improperly positioned media pad. Reposition.
- H. Supply voltage exceeding 132 VAC. Change power pack supply lead to low tap.
- I. Vibration from external source. Eliminate vibration source or isolate air cleaner.



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Figure 14—Replacing Ionizer Wire

4. AIR NOT BEING CLEANED

Be sure indicator light is glowing, showing proper electrical operation. Check for:

- A. No power to ionizer and collector sections. Check for proper contact between bus-bar on power door and "T" handles on ionizer and collector sections.
- B. Airflow through unit set too high. Use velometer to adjust to no more than 350 ft/min.
- C. Leaks in ductwork, blower box, and other parts of system under negative pressure on clean air side of air cleaner. Seal leaks with duct tape or caulking.
- D. Dirty air not being delivered to the cleaner as result of blocked return air grills. Remove drapes, furniture, or any other obstruction.
- E. Uneven air distribution across face of unit. Install turning vanes or air baffles to even air distribution. An even collection of dirt across entering side of a media pad indicates good distribution.

5. RADIO OR TV INTERFERENCE

Check for:

- A. Improper grounding. Ascertain that power pack has good electrical ground.
- B. Supply line voltage ground line not properly grounded. Correct.
- C. Loose ionizer wires. Replace.
- D. Foreign particles lodged in ionizer section. Remove.
- E. Loose connections on components or primary wiring within power door. Tighten connections.
- F. Defective power pack. Replace.
- G. Dents in one or more grills or center plate. Straighten or replace.
- H. Damaged media pad. Replace.
- I. Improperly installed pad. Reposition.

6. WHITE DUST

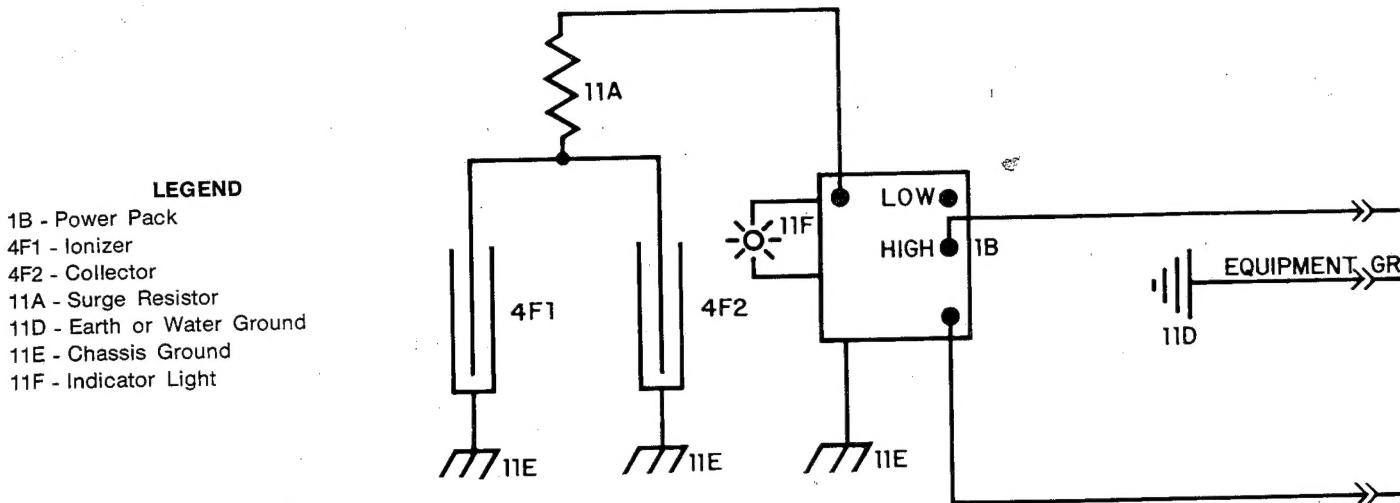
"White dust" may be noticed on furnishings, especially when the cleaner first begins to function. It is especially noticeable on dark furniture. "White dust" is largely composed of lint, which because of its weight settles before it reaches the air returns. The amount of lint generated is increased by new furnishings or draperies and the activity of children and pets. Large, clean lint particles have no staining or soiling properties.

SEQUENCE OF OPERATION

When system blower is in operation, power pack (1B) is energized with $120\text{-V}\pm10\%$ single phase, 60 Hz AC current.

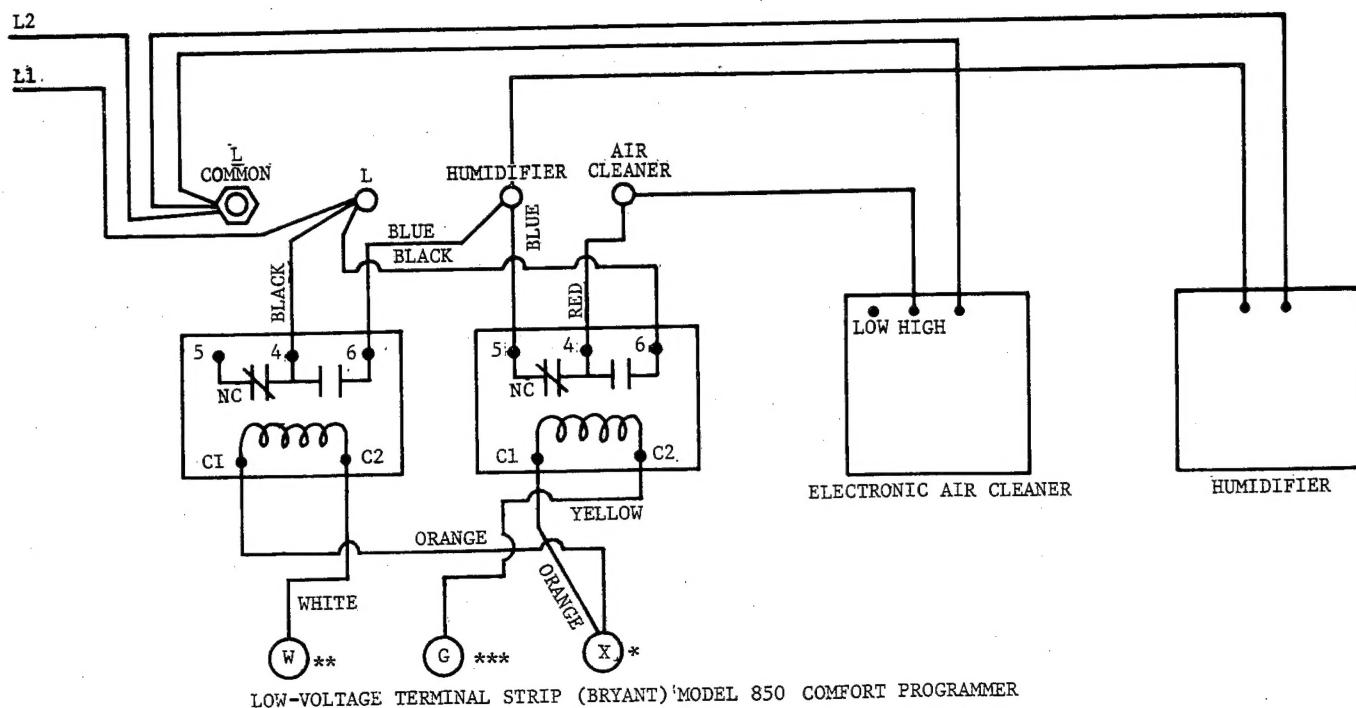
The enclosed power pack transformer secondary output of approximately 3600 VAC alternately charges two capacitors through two silicon rectifiers. The total charge across both capacitors results in a power

pack output of approximately 7000-7500 VDC. Current from the enclosed power pack flows through the surge resistor (11A) and energizes the ionizer section (4F1) and collector section (4F2).



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Figure 15—Line-to-Line Wiring Diagram



NON-BRYANT:

* COMMON SIDE OF TRANSFORMER

** TERMINAL FOR HEATING SIDE OF THERMOSTAT

*** TERMINAL FOR COOLING SIDE OF THERMOSTAT

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Figure 17—Wiring Diagram of Model 850 Comfort Programmer
Used to Control Model 907

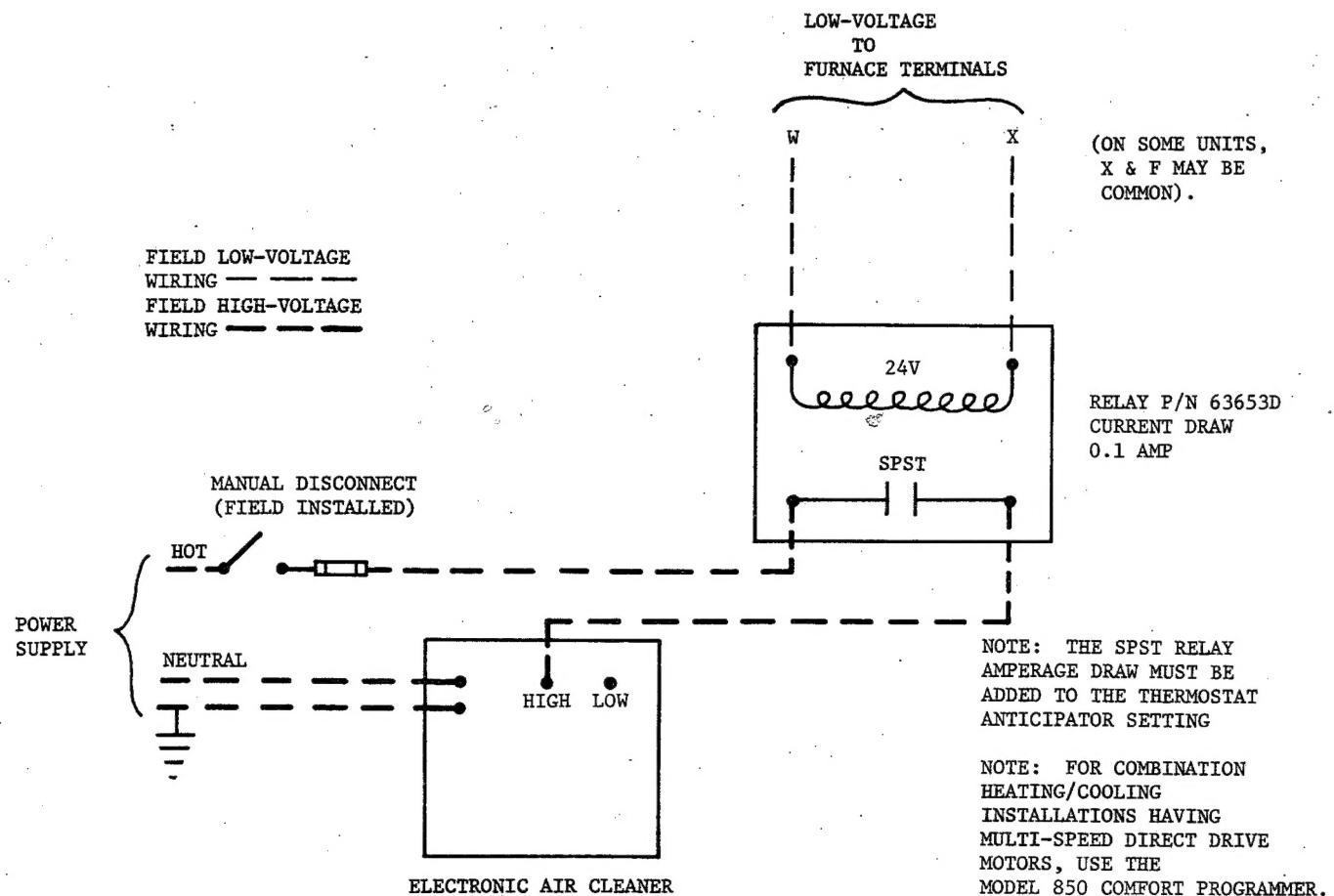
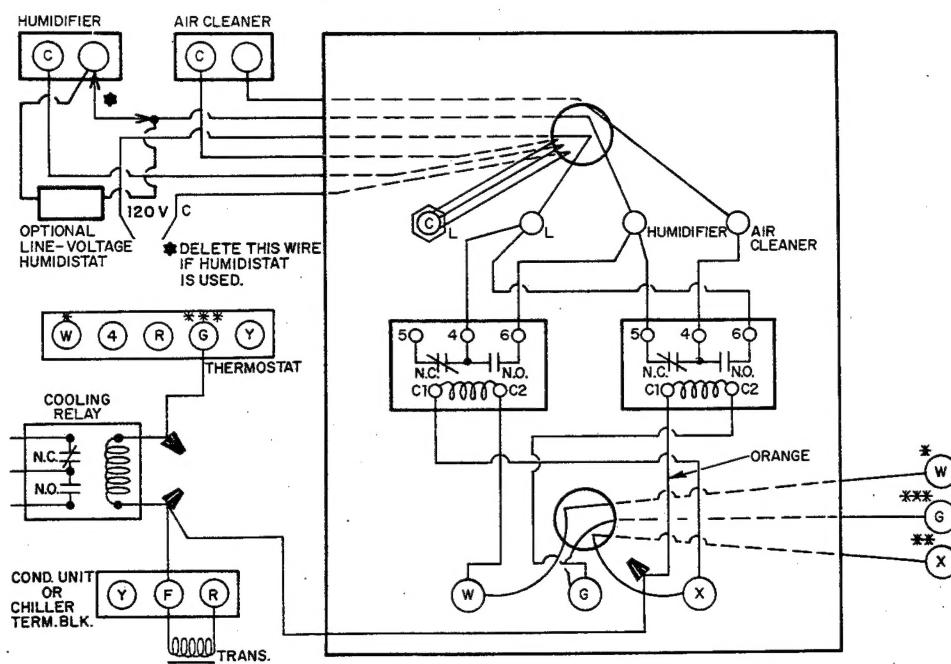


Figure 16—Wiring Diagram for Model 907 Connected
to Heating Only Furnace (No Humidifier)



* TO "W" WIRE FROM THERMOSTAT.
** TO TRANSFORMER TERMINAL
COMMON WITH GAS VALVE.
*** TO "G" WIRE FROM THERMOSTAT

A69320

Figure 18—Wiring Diagram for Comfort System Control Center 120-V
System for Heating and Cooling—Two Transformers.